

What is claimed is:

1. In a data communications device, a method for inserting data into packets associated
5 with a communications session between a first and second computerized devices, the
method comprising the steps of:

receiving a first packet containing data being propagated from the first
computerized device to the second computerized device in the communications session;
inserting a first amount of extra data into the first packet to alter the size of the
10 first packet; and

forwarding the first packet including the first amount of extra data to the second
computerized device.

2. The method of claim 1 further comprising the steps of:

15 receiving a second packet being propagated from the second computerized device
to the first computerized device in the communication session, the second packet
including acknowledgement information for the first packet acknowledging receipt of the
first packet by the second computerized device;

adjusting the acknowledgement information in the second packet based upon the
20 first amount of extra data inserted into the first packet; and

forwarding the second packet including the adjusted acknowledgement information
to the first computerized device such that the first computerized device receives the
adjusted acknowledgement information that properly corresponds with a first connection
state maintained by the first computerized device for the communications session
25 between the first and second computerized devices.

3. The method of claim 2 wherein the step of adjusting the acknowledgement
information comprises the step of subtracting from the acknowledgement information a
value equal to the first amount of extra data added to the first packet.

4. The method of claim 1 further comprising the steps of:

adjusting sequence information in a subsequent packet being propagated, after the first packet, from the first computerized device to the second computerized device to account for the extra data added into the first packet; and

5 forwarding the subsequent packet including the adjusted sequence information to the second computerized device such that the second computerized device receives the adjusted sequence information that properly corresponds with a second connection state maintained by the second computerized device for the communications session between the first and second computerized devices.

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5. The method of claim 4 wherein the step of adjusting sequence information in a subsequent packet comprises the step of adding to the sequence information a value equal to the first amount of extra data added to the first packet such that the step of forwarding the subsequent packet causes the second computerized device to receive the adjusted sequence information.

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6. The method of claim 2 comprising the steps of:

continuing to exchange subsequent packets between the first and second computerized devices, and for each packet exchanged, adjusting connection state information including sequence and acknowledgement information to account for extra data added into all packets exchanged between the first and second computerized devices such that the first and second computerized devices are able to maintain proper respective first and second connection states.

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7. The method of claim 1 comprising the steps of:

maintaining connection state data in the data communications device that tracks an amount of extra data inserted into packets exchanged between the first and second computerized devices; and

modifying connection information within packets passing through the data communications device that are exchanged between the first and second computerized

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devices to allow the first and second computerized devices to maintain proper respective first and second connection states regardless of the amount of extra data added in the packets.

- 5 8. The method of claim 7 wherein the step of modifying connection information comprises at least one of the steps of:

adjusting sequence information within the packets exchanged between the first and second computerized devices;

adjusting acknowledgement information within the packets exchanged between

- 10 the first and second computerized devices;

adjust error correction information within the packets exchanged between the first and second computerized devices; and

adjust packet length information within the packets exchanged between the first and second computerized devices.

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9. The method of claim 7 comprising the steps of:

receiving a second packet being propagated from the second computerized device to the first computerized device in the communication session, the second packet including acknowledgment information for the first packet acknowledging receipt of the first packet by the second computerized device;

adjusting the acknowledgment information in the second packet based upon the first amount of extra data inserted into the first packet; and

inserting a second amount of extra data into the second packet to alter the size of the second packet; and

- 25 forwarding the second packet including the adjusted acknowledgment information and the second amount of extra data to the first computerized device such that the first computerized device receives the adjusted acknowledgement information that properly corresponds with a first connection state maintained by the first computerized device for the communications session between the first and second computerized devices and
30 further receive the second amount of extra data; and

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wherein the step of maintaining connection state data in the data communications device that tracks an amount of extra data inserted into packets exchanged between the first and second computerized devices tracks the second amount of extra data inserted into the second packet; and

5 wherein the step of modifying connection information within packets passing through the data communications device that are exchanged between the first and second computerized devices modifies connection information with packets exchanged between the first and second computerized devices subsequent to the first and second packets such that the first and second amount of extra data to not adversely effect respective first and
10 second connection states respectively maintained in the first and second computerized devices.

10. The method of claim 1 wherein the first packet contains a hypertext transport protocol packet requesting data from a hypertext transport protocol server accessible by
15 the second computerized device.

11. A data communications device capable of inserting data into packets associated with a communications session between a first and second computerized devices, the data communications device comprising:

20 at least one communications interface;
 a memory;
 a processor; and
 an interconnection mechanism coupling the at least one communications interface, the memory and the processor;

25 wherein the memory is encoded with an insertion manager application that when performed on the processor, produces an insertion manager process that causes the computerized device to insert data into packets associated with a communications session between a first and second computerized devices by performing the operations of:

 receiving a first packet containing data being propagated from the first
30 computerized device to the second computerized device in the communications session;

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inserting a first amount of extra data into the first packet to alter the size of the first packet; and

forwarding the first packet including the first amount of extra data to the second computerized device.

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12. The data communications device of claim 11 wherein the insertion manager process causes the data communications device to perform the operations of:

receiving a second packet being propagated from the second computerized device to the first computerized device in the communication session, the second packet

10 including acknowledgment information for the first packet acknowledging receipt of the first packet by the second computerized device;

adjusting the acknowledgment information in the second packet based upon the first amount of extra data inserted into the first packet; and

15 forwarding the second packet including the adjusted acknowledgment information to the first computerized device such that the first computerized device receives the adjusted acknowledgement information that properly corresponds with a first connection state maintained by the first computerized device for the communications session between the first and second computerized devices.

20 13. The data communications device of claim 12 wherein when the insertion manager process causes the data communications device to perform the operation of adjusting the acknowledgement information, the insertion manager process causes the data communications device to perform the operation of subtracting from the acknowledgement information a value equal to the first amount of extra data added to the first packet.

25 14. The data communications device of claim 11 wherein the insertion manager process causes the data communications device to perform the operations of :

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adjusting sequence information in a subsequent packet being propagated, after the first packet, from the first computerized device to the second computerized device to account for the extra data added into the first packet; and

forwarding the subsequent packet including the adjusted sequence information to
5 the second computerized device such that the second computerized device receives the adjusted sequence information that properly corresponds with a second connection state maintained the second computerized device for the communications session between the first and second computerized devices.

10 15. The data communications device of claim 14 wherein when the insertion manager process causes the data communications device to perform the operation of adjusting sequence information in a subsequent packet, the insertion manager process causes the data communications device to perform the operation of adding to the sequence information a value equal to the first amount of extra data added to the first packet such
15 that the step of forwarding the subsequent packet causes the second computerized device to receive the adjusted sequence information.

16. The data communications device of claim 12 wherein the insertion manager process causes the data communications device to perform the operation of :

20 continuing to exchange subsequent packets between the first and second computerized devices, and for each packet exchanged, adjusting connection state information including sequence and acknowledgement information to account for extra data added into all packets exchanged between the first and second computerized devices such that the first and second computerized devices are able to maintain proper respective
25 first and second connection states.

17. The data communications device or claim 11 wherein the insertion manager process causes the data communications device to perform the operations of :

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maintaining connection state data in the data communications device that tracks an amount of extra data inserted into packets exchanged between the first and second computerized devices; and

modifying connection information within packets passing through the data

- 5 communications device that are exchanged between the first and second computerized devices to allow the first and second computerized devices to maintain proper respective first and second connection states regardless of the amount of extra data added in the packets.

- 10 18. The data communications device of claim 17 wherein when the insertion manager process causes the data communications device to perform the operation of modifying connection information, the insertion manager process causes the data communications device to perform at least one of the operations of :

adjusting sequence information within the packets exchanged between the first

- 15 and second computerized devices;

adjusting acknowledgement information within the packets exchanged between the first and second computerized devices;

adjust error correction information within the packets exchanged between the first and second computerized devices; and

- 20 adjust packet length information within the packets exchanged between the first and second computerized devices.

19. The data communications device of claim 17 wherein the insertion manager process causes the data communications device to perform the operations of :

- 25 receiving a second packet being propagated from the second computerized device to the first computerized device in the communication session, the second packet including acknowledgment information for the first packet acknowledging receipt of the first packet by the second computerized device;

- 30 adjusting the acknowledgment information in the second packet based upon the first amount of extra data inserted into the first packet; and

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inserting a second amount of extra data into the second packet to alter the size of the second packet; and

forwarding the second packet including the adjusted acknowledgement information and the second amount of extra data to the first computerized device such that the first
5 computerized device receives the adjusted acknowledgement information that properly corresponds with a first connection state maintained by the first computerized device for the communications session between the first and second computerized devices and further receive the second amount of extra data; and

wherein the step of maintaining connection state data in the data communications
10 device that tracks an amount of extra data inserted into packets exchanged between the first and second computerized devices tracks the second amount of extra data inserted into the second packet; and

wherein the step of modifying connection information within packets passing through the data communications device that are exchanged between the first and second
15 computerized devices modifies connection information with packets exchanged between the first and second computerized devices subsequent to the first and second packets such that the first and second amount of extra data to not adversely effect respective first and second connection states respectively maintained in the first and second computerized devices.

20 20. The data communications device of claim 11 wherein the first packet contains a hypertext transport protocol packet requesting data from a hypertext transport protocol server accessible by the second computerized device.

25 21. A computer program product having a computer-readable medium including computer program logic encoded thereon that, when performed on a processor in a computerized device having a coupling of a memory, a processor, and at least one communications interface provides a method for inserting data into packets associated with a communications session between a first and second computerized devices by
30 causing the computerized device to perform the operations of:

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receiving a first packet containing data being propagated from the first computerized device to the second computerized device in the communications session;

inserting a first amount of extra data into the first packet to alter the size of the first packet; and

5 forwarding the first packet including the first amount of extra data to the second computerized device.

22. A data communications device capable of inserting data into packets associated with a communications session between a first and second computerized devices, the data

10 communications device comprising:

at least one communications interface;

a memory;

a processor; and

an interconnection mechanism coupling the at least one communications

15 interface, the memory and the processor;

wherein the memory is encoded with an insertion manager application that when performed on the processor, produces an insertion manager process that causes the computerized device to insert data into packets associated with a communications session between a first and second computerized devices by providing means including:

20 means for receiving a first packet containing data being propagated from the first computerized device to the second computerized device in the communications session;

means for inserting a first amount of extra data into the first packet to alter the size of the first packet; and

25 means for forwarding the first packet including the first amount of extra data to the second computerized device.

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